REMARKS

Claims 1-3 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (U.S. Patent No. 6,490,139 B1), in view of Yuasa et al. (U.S. Patent No. 6,710,984 B1). In response, Applicant amended independent claims 1 and 5 to clarify the location of the first and second insulating films as being interposed between a magnetic domain control pattern and the first electrode on a top surface of the magneto-resistive film, and respectfully traverses.

On page 3, last paragraph of the Office Action, Hayashi is cited as disclosing a first insulating film 27 (left-hand side) covering a first magnetic domain control pattern and a second insulating film 27 (right-hand side) covering the second magnetic domain control pattern, such that the first insulating film is interposed between the first magnetic domain control pattern and the first electrode and the second insulating film is interposed between the second magnetic domain control pattern and the first electrode (See also FIG. 3A). Applicant respectfully believes that the insulation layer is defined as layers 28, and not the bias layers 27. As noted in col. 8, ln. 4 of Hayashi, the insulation layer 28 is formed on the bias layer 27. An upper electrode layer 29 is formed so as to cover the insulation layer 28 and expose free layer 26, as shown in FIG. 3A (See col. 8, lns. 8-10). Insulating films 28 of Hayashi are not disposed between electrodes 29 and the top surface of the MR film, as now defined in amended independent claims 1 and 5.

Yuasa discloses a current-in-plane magnetic head that offsets a current path of a sensing current from domain control regions. However, Yuasa fails to disclose or suggest

using first and second insulating films for causing offset in the current path from the magnetic domain control regions, or the interposing of an insulating film on a top surface of the magneto-resistive film, as now recited in amended claims 1 and 5.

In contrast, amended claims 1 and 5 now recite that the first and second insulating films are formed on a top surface of the magneto-resistive film. As shown in FIG. 3H of the present application, for example, insulating films 109A, B are formed on the magneto-resistive layer 104 so as to be interposed between the respective domain patterns 107A, 107B and the top electrode 110. Thus, the present invention can affectively cause offset of the sensing current path for the magnetic domain control regions, and therefore it is possible to suppress Barkhausen noise effectively. Since Hayashi is silent regarding this feature of the insulating film being formed on a top surface of the magneto-resistive film, and Yuasa also fails to overcome the deficiencies of Hayashi, withdrawal of the §103 rejection of claims 1-3 and 5 is respectfully requested.

Claims 4 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yuasa. In response, Applicant amended independent claims 4 and 6 to clarify the feature that the magnetic domain control regions are provided at the lateral edges of the magneto-resistive film, and respectfully traverses.

Yuasa discloses magnetic domain control regions 43 (FIG. 4) that are provided at the top surface of the MR film. Accordingly, magnetic domain control of the MR film is achieved only through the top surface part thereof. In Yuasa, an injection of sensing current occurs not only at the top surface of the MR film, but also at the entire lateral edge surface of

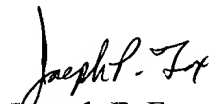
the MR film. The lateral edge surface of the MR film includes a lamination of a free layer and a pinned layer. Thus, in the structure of Yuasa, the MR effect becomes obscured by the current injected laterally to both the pinned layer and the free layer.

In contrast, amended claims 4 and 6 now clarify that the magnetic domain control regions are at the lateral edges of the MR film. On example of which is shown in Applicant's FIG. 4F, which includes magnetic domain control regions 202A and 202B and MR film 204. In the present invention, domain control is achieved for the entire thickness of the MR film. Furthermore, it is possible to use a ferromagnetic material in the structure of the present invention, as long as the ferromagnetic material has a sufficiently large coercive force (See FIG. 4F of the present application). Additionally, Applicant's FIG. 4F also shows that the outer edges of electrodes 203A and 203B are aligned with corresponding outer edges of magnetic domain control regions 202A and 202B, as now defined in claims 4 and 6. In contrast, in FIG. 4 of Yuasa, the outer edges of electrodes 45 extend past the outer edges of members 43. Thus, this feature is also lacking in Yuasa. For these reasons, withdrawal of the §103 rejection of claims 4 and 6 is respectfully requested.

For all of the foregoing reasons, Applicant submits that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
Joseph F. Fox
Registration No. 41,760

November 1, 2005
300 South Wacker Drive - Suite 2500
Chicago, Illinois 60606
Telephone: 312.360.0080
Facsimile: 312.360.9315
Customer Number 24978
P:\DOCS\0941\65367\9M9745.DOC